

REMARKS

In presently-numbered paragraph [0029] of the instant application, Applicant incorporated by reference U.S. Patent Application 10/065,018, now U.S. Patent No. 7,015,640 (the “ ’640 Patent”). During an in-person interview between Applicant’s attorney and the examiner, the examiner requested that Figure 4 of the ’640 Patent, along with the section of the specification discussing Figure 4, be explicitly recited in the instant application. Applicant has done so in accordance with the examiner’s request, where Figure 4 in the ’640 Patent has been renumbered Figure 8 in the instant application. No new matter has been added to the instant application.

Regarding the Rejections

Each of the two independent claims stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Chung, et al. (U.S. Patent No. 6,836,070, hereinafter “Chung”) in view of Moser (U.S. Patent Application Pub. No. US2003/0148139, hereinafter “Moser”) and Chopra (U.S. Patent No. 6,413,858, hereinafter “Chopra”). Additionally, Claims 1, 4-8, and 11-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Graff, et al. (U.S. Patent No. 6,492,026, hereinafter “Graff”) in view of Moser and Chopra. Furthermore, the two independent claims stand rejected under 35 U.S.C. § 103(a) as unpatentable over Silvernail (U.S. Patent No. 6,576,351, hereinafter “Silvernail”) in view of Moser and Chopra. The examiner groups the rejections into three groups based on the three primary references (Chung, Graff, and Silvernail). Each

of the three groups relies on secondary references Moser and Chopra to support the obviousness rejection: Moser for (a) the limitation of **an organic polymer layer varying substantially continuously across a thickness of the diffusion barrier** (“Limitation A”), or Chopra for (b) the limitation of an **inorganic layer varying substantially continuously across a thickness of the diffusion barrier** (“Limitation B”).

Each of the two independent claims includes the limitation “at least one of said diffusion-inhibiting barriers comprises a material, the composition of which varies substantially continuously across a thickness thereof”.

Regarding the diffusion barrier layer in Moser, the examiner relies on Moser to show a continuously varying organic polymer layer (Limitation A). Moser requires “metal-containing particles . . . formed as individual grains or as a conglomerate of several grains” (*see Moser at [0011]*) (emphasis added) where the metal-containing particles are dispersed in an organic layer matrix. Moser also discloses, at [0016], that “the concentration of metal-containing components decreases as the thickness of the protection and/or diffusion barrier layer increases, in particular the metal particles diminish continuously in the direction of the surface” in order to affect the electrical conductivity of the barrier layer. In other words, Moser teaches a suspension of metal particles in an organic layer matrix that allows the designer to tailor the electrical properties of the layer. While there appears to be a gradient of discrete particles in the Moser diffusion layer, this is not a layer where the composition of the layer varies substantially continuously across a thickness of the layer, as is that term is known in the art. Indeed, there is no disclosure anywhere in Moser that indicates that the organic layer

varies substantially continuously across a thickness of the layer. Rather, it is a “matrix” the composition of which is constant throughout the thickness of the layer. Instead, Moser’s diffusion layer is like a suspension. Moser teaches step-wise discontinuities of metal particles in an organic layer matrix that is constant throughout the thickness of the diffusion layer.

The present application discloses and claims a diffusion-inhibiting barrier layer where the composition of the layer varies substantially continuously across a thickness of the layer:

(a) The Example on page 11 (paragraph [0035]) of the application discloses an embodiment of a layer with a continuously-varying composition across a thickness: “a graded (inorganic/organic) barrier coating with a composition that was initially inorganic in nature, then continuously changed into a dominantly organic nature, and finally changed back to an inorganic nature.”

(b) Paragraph [0028] discloses another embodiment which illustrates a layer with a continuously-varying composition across a thickness: “In one embodiment, a graded composition of the coating is obtained by changing the compositions of the reactants fed into the reactor chamber during the deposition of reaction products to form the coating. Varying the relative supply rates or changing the identities of the reacting species results in a diffusion-inhibiting barrier or coating that has a graded composition across its thickness.”

(c) Figure 4 of U.S. Patent No. 7,015,640 issued to Schaepekens, et al. (U.S. Application No. 10/065,018), which is incorporated by reference in the instant

application, shows a further example of a diffusion-inhibiting layer having a composition which varies substantially continuously across a thickness of the layer. As described in the Schaepkens patent at col. 6 lines 62-66, Figure 4 shows the composition of the coating as a function of sputtering time which is related directly to the depth of the coating. As can be seen from Figure 4, the composition of the components of carbon, silicon, and nitrogen vary across the thickness of the coating.

The embodiments described in (a), (b), and (c) are examples of the meaning in the art of the terminology of a diffusion-inhibiting barrier comprising a material, the composition of which varies substantially continuously across a thickness thereof.

Therefore, the diffusion barrier layer in Moser is not a layer for which the composition varies substantially continuously across a thickness of the layer, as that term is understood in the art.

A declaration under 37 CFR §1.132 regarding the foregoing from one of skill in the art is attached.

CONCLUSION

Accordingly, Applicant respectfully requests withdrawal of the outstanding rejections and allowance of all pending claims in the instant application.

The Commissioner is hereby authorized to charge payment of any additional fees associated with this communication or credit any overpayment to Deposit Account No. 04-1679. A duplicate copy of this sheet is enclosed.

Respectfully submitted,



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IN THE DRAWINGS

Please insert the drawing labeled “Fig. 8” into the application. The drawing is attached to this Amendment.